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| **Course code** | CC8 |
| **Type and description** | CC – core curriculum for the discipline Materials Engineering |
| **ECTS credit** | 1 |
| **Course name** | **Strength of Materials** |
| **Course name in Polish** | **Wytrzymałość materiałów** |
| **Language of instruction** | English |
| **Course level** | 8 PRK |
| **Course coordinator** | **Prof. dr hab. inż. Ryszard Korycki** |
| **Course instructors** | **Prof. dr hab. inż. Ryszard Korycki** |
| **Delivery methods and course duration** | |  | **Lecture** | **Tutorials** | **Laboratory** | **Project** | **Seminar** | **Other** | **Total of teaching hours during semester** | | --- | --- | --- | --- | --- | --- | --- | --- | | Contact hours | 8 |  | 7 |  |  | 0 | 15 | | E-learning | No | No | No | No | No | No |  | | Assessment criteria (weightage) | 0,50 |  | 0,50 |  |  | 0,00 |  | |
| **Course objective** | Course objective  1. The aim of the course is to enable PhD students to acquire knowledge in assessment of strength of materials. |
| **Learning outcomes** | After the finished course the PhD student is able to:  1. Model the stress and strain of both elastic materials and textile materials subjected to tension, torsion and bending for isotropic, orthotropic and anisotropic materials – effects W1, U1.  2. Determine the physical and mathematical models, as well as solve the mathematical model; Visualize of state fields - effects W1, U1.  3. Determine the influence of external conditions (heat, moisture) on the distribution of state variables – effects W1, U1. |
| **Assessment methods** | Assessments methods:  Effect W1 - colloquium covering the tutorials material  Effect U1 - assessment of laboratory material  Final grade is a sum of::  grade of tutorial assessment 50%  grade of assessment covering laboratory material 50% |
| **Prerequisites** | None |
| **Course content with delivery methods** | TUTORIAL  1. Displacements, stress, strain and strength criterion. Tension of prismatic bars. Torsion of circular bars. Diagrams of torsional moments. Bending of prismatic bars. Theory of clear simple torsion. Isotropic, orthotropic, anisotropic materials and their influence on strain distribution.  2. Modeling of strength problems. Normal forces and stresses during torsion. Torsional stresses and torsional angle. Internal forces, bending moments.  3. Influence of external conditions (heat, moisture) on the material. Change of material characteristics under influence of heat, moisture and other factors.  LABORATORY  1. Tension, torsion and bending of complex structures (elements composed of a few materials, phase change materials etc.). Determination of strain and stress distribution. |
| **Basic reference materials** | Tutorial material,  1. Leyko J.: Mechanika ogólna - tom 1, 2 i 3. PWN, Warszawa, każde wydanie.  2. Niezgodziński M.E., Niezgodziński T.: Wytrzymałość materiałów. PWN, Warszawa, każde wydanie po 1990 |
| **Other reference materials** | Niezgodziński M.E., Niezgodziński T.: Zbiór zadań z wytrzymałości materiałów. PWN, Warszawa, każde wydanie po 1990 |
| **Average student workload outside classroom** | 10 h |
| **Comments** | None |
| **Last update** |  |